

What is claimed is:

1. A purified mammalian protein having the ability to bind the cytoplasmic region of CD40 receptor.
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2. A polypeptide fragment of the protein of claim 1.
- 10
3. The purified mammalian protein of claim 1, wherein the mammalian protein is a human protein having a molecular weight of about 64 kD.
- 15
4. A composition comprising the purified mammalian protein of claim 1 or 2 and an acceptable carrier.
- 20
5. A pharmaceutical composition comprising the purified mammalian protein of claim 1 or 2 and a pharmaceutically acceptable carrier.
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6. An isolated nucleic acid molecule coding for the protein of claim 1.
7. An isolated nucleic acid molecule coding for the polypeptide of claim 2.
- 30
8. An isolated nucleic acid molecule of claim 6, wherein the nucleic acid molecule comprises nucleic acids selected from the group consisting of DNA, cDNA or RNA.
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9. An isolated nucleic acid molecule of claim 7, wherein the nucleic acid molecule comprises

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nucleic acids selected from the group consisting of DNA, cDNA or RNA.

10. An isolated nucleic acid molecule of claim 8 or 9, operatively linked to a promoter of RNA transcription.
11. An expression vector which comprises the isolated nucleic acid molecule of claim 8 or 9.
10. 12. A vector of claim 11, wherein the vector is a plasmid, a cosmid, a yeast or a virus.
13. A host vector system, which comprises the isolated nucleic acid of claim 10 in a host cell.
14. A host vector system of claim 13, wherein the host cell is a eucaryotic cell.
15. A host vector system of claim 14, wherein the eucaryotic cell is selected from the group consisting of a mammalian cell, an insect cell, a yeast cell, a human cell, or an animal cell.
16. A host vector system of claim 13, wherein the host cell is a procaryotic cell.
17. A host vector system of claim 16, wherein the procaryotic cell is a bacterial cell.
18. An antibody capable of specifically forming a antibody complex with the protein of claim 1.
19. The antibody of claim 18, wherein the antibody is a polyclonal antibody.

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20. The antibody of claim 18, wherein the antibody is a monoclonal antibody.
21. The antibody of claim 18, wherein the antibody is conjugated to a detectable agent.
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~~22 23.~~
~~Sub
a2~~
23. An agent having the ability to inhibit the ability of the protein of claim 1 to bind to the cytoplasmic domain of CD40 receptor.
- ~~22~~
23. The agent of claim 23, wherein the agent is an anti-CD40bp antibody or a dominant inhibitory fragment of CD40bp.
- ~~24 25.~~
25. A biologically active fragment of the antibody of claim 19 or 23.
- ~~25 26.~~
26. The agent of claim 24, wherein the anti-CD40bp antibody is a polyclonal antibody.
- ~~26 27.~~
27. The agent of claim 24, wherein the anti-CD40 antibody is a monoclonal antibody.
- ~~27 28.~~
28. A hybridoma cell line which produces the monoclonal antibody of claim 20 or 26.
- ~~28 29.~~
29. A method of producing a mammalian protein or polypeptide having the ability to bind the cytoplasmic region of CD40 receptor, which comprises growing the host cell of claim 13 under suitable conditions such that the nucleic acid is transcribed and translated into protein and purifying the protein so produced.
- ~~29 30.~~
30. A method of modulating cellular function regulated by the CD40 in a cell, which

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comprises introducing into the cell a CD40bp nucleic acid and growing the cell under suitable conditions such that the nucleic acid is transcribed and translated into CD40bp protein in the cell.

~~30~~ 31. The method of claim ~~30~~²⁹, wherein the CD40bp nucleic acid codes for an anti-CD40 antibody.

~~31~~ 32. The method of claim ~~30~~²⁹, wherein the nucleic acid codes for human CD40bp.

~~32~~ 33. A method for screening for a CD40 immunosuppressive agent, which comprises:

- a) providing a CD40 cytoplasmic domain receptor bound to a solid support;
- b) contacting the agent with the receptor bound support of step a) under conditions favoring binding of the cytoplasmic domain to the receptor to CD40bp;
- c) contacting detectably-labeled CD40bp to the solid support of step b) under conditions favoring binding of CD40 cytoplasmic domain receptor to CD40bp;
- d) detecting the presence of any complex formed between CD40 receptor and CD40bp to form CD40 receptor-CD40bp complex; and
- e) the absence of CD40 receptor-CD40bp complex being indicative that the agent inhibits binding of CD40bp to CD40 receptor and therefore is an immunosuppressive agent.

~~33~~ 34. A method for screening for a CD40 immunosuppressive agent, which comprises:

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- a) providing a CD40 cytoplasmic domain receptor bound to a solid support;
- b) contacting detectably-labeled CD40bp to the solid support of step a) under conditions favoring binding of CD40 cytoplasmic domain receptor to CD40bp;
- c) contacting the agent to be screened with the receptor bound support of step b) under conditions favoring binding of the cytoplasmic domain to the receptor to CD40bp;
- d) detecting the presence of any complex formed between CD40 receptor and CD40bp to form CD40 receptor-CD40bp complex; and
- e) the absence of CD40 receptor-CD40bp complex being indicative that the agent inhibits binding of CD40bp to CD40 receptor and therefore is an immunosuppressive agent.

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a³

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E¹